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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,101	03/30/2004	Hari Nadathur Seshadri	145204/YOD GERD:0090	5551
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Tait R. Swanson Fletcher Yoder P.O. Box 692289 Houston, TX 77269-2289			EXAMINER HOANG, TU BA	
			ART UNIT 2832	PAPER NUMBER

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/813,101	<b>Applicant(s)</b> SESHADRI ET AL.	
	<b>Examiner</b> Tu Ba Hoang	<b>Art Unit</b> 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 24-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☒ Claim(s) 6,9 and 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/30/04&amp;06/25/04</u> . | 6) <input type="checkbox"/> Other: _____  |

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### ***Drawings***

The drawings were received on March 30, 2004. These drawings are approved.

### ***Election/Restrictions***

Applicant's election with traverse of group I, claims 1-23 in the reply filed on November 14, 2005 is acknowledged. The traversal is on the ground(s) of a lack of serious burden" on the Examiner. As set forth in the Manual of Patent Examining Procedure, the criteria for restriction between patentably distinct inventions includes: (1) the inventions must be independent or distinct, and (2) there must be a serious burden on the Examiner. See M.P.E.P. § 803. Applicants stress that:

If the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions.

M.P.E.P. § 803. For these reasons, Applicants respectfully request that the Examiner withdraw the restriction requirement and examine all pending claims (emphasis added). This is not found persuasive because Applicants did not distinctly and specifically point out the supposed errors which may or may not cause a lack of serious burden on the Examiner. It is noted that the restriction requirement set forth in the previous Office Action has indicated that there is a serious burden of search on the Examiner since Inventions I and II were related as product and process of use. In which the inventions had been shown to be distinct and in the instant case the product of group I could be used in a materially different process such as used as a heater or oxygen sensor in automobile and furthermore, because these inventions had also acquired a separate status in the art as shown by their different classification, It is clear there must be serious burden of search on the Examiner. Also for example, there is no requirement of calcining or sintering the shell or cover of the thermistor as the thermistor can be made by another materially different process and the search of the temperature measuring system of group I does not require the search of such calcining or sintering.

The requirement is still deemed proper and is therefore made FINAL.

Claims 24-40 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Claim Objections***

Claims 6, 9 and 15 are objected to because of the following informalities:

In claims 6 and 15, the term "Td" recited on line 2 is misspelled. It should be "Tb" instead.

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In claim 9, the term "M<sub>2</sub>O<sub>3</sub>" recited at line 2 should be "M<sub>2</sub>O<sub>3</sub>".  
Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "the at least one compound" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim or from the preceding claim 1.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 23 is rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al (DE 4021997 A1). Suzuki et al shows a temperature measuring system comprising means for materially stabilizing (i.e., a heat resistant metal tube 105 or 111 shown in Figures 2 and 7-8) a thermistor 101 comprising Chromia (or chromium oxide, i.e., Cr<sub>2</sub>O<sub>3</sub>) and at least one stabilizing material (i.e., titanium oxide, manganese oxide and silicon oxide, see translated abstract), and means or terminal wires 107 for electrically contacting the thermistor 101 (as shown in Figure 2).

Claim 23 is further rejected under 35 U.S.C. 102(b) as being clearly anticipated by Soda et al (US 3,958,209) cited by the Applicants. Soda et al shows a temperature measuring system 3 comprising means for materially stabilizing a thermistor 1 comprising Chromia (or chromium oxide, i.e., Cr<sub>2</sub>O<sub>3</sub>) and at least one stabilizing material (i.e., aluminum oxide, manganese oxide and/or titanium oxide, see abstract), and means or terminal wires 2 for electrically contacting the thermistor 1.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9, 11-18, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al (US 4,058,787) in view of Kuzuoka et al (US 2002/0020949). Ichikawa et al discloses substantially all features of the claimed invention including a temperature measuring system which comprises a heat source or an engine, a component or catalytic converter coupled to the engine and at least one thermistor 1 coupled to the component or catalytic converter and adapted to monitor temperature of the exhaust gases or of the catalytic converter (column 1, lines 1-5, i.e., the temperature sensor using a thermistor for measuring the temperature of exhaust gases of an automotive engine and column 2, lines 8-12, i.e. for giving an alarm in the case the temperature within a catalytic converter exceeds the preset value, it is inherently shown that the catalytic converter must be connected to the engine), and a plurality of electrical contacts 3a,3b, wherein there is also a measuring device or temperature sensor (as a whole shown in Figure 1) coupled to the thermistor 1 (i.e. using or including the thermistor 1) and thermistor can be substantially stable at a temperature up to about 1000 degrees Celsius (column 1, line 34, i.e., withstand a very high temperature such as 1,100°C and column 2, line 68).

Ichikawa et al fails to show the thermistor comprises a core-shell micro structure having a shell disposed about a core, wherein the core comprises  $\text{Cr}_2\text{O}_3$  and the shell comprises a rare earth element compound which can be selected from a group consisting of Pr, Nd, Sm, Eu, Gd, Tb, Dy, Er, Yb, Ce, and Y or can be formed by at least one compound selected from a group consisting of the rare earth compound -oxide, - $\text{CrO}_3$ , -nitrate, -carbonate, -hydroxide, alkoxides, carboxylates, a mixture of  $\text{M}_2\text{O}_3$  and  $\text{Cr}_2\text{O}_3$ .

The use of rare earth compounds in thermistor body of temperature sensing device having  $\text{Cr}_2\text{O}_3$  to improve its resistivity temperature coefficient in high temperature environment of about 1000 °C or higher (such as in automobile exhaust gas) as well as to provide the stable properties is old and well known in the art, as evidence, Kuzuoka et al discloses the use of a thermistor element 1 for detecting a high temperature of an automobile exhaust gas (page 1, paragraph [0004]), wherein the thermistor element comprises a core-shell micro structure (i.e., mixed sintered body of composition  $(\text{MM}')\text{O}_3$  and a metallic compound  $\text{AO}_3$ ) having a shell of rare earth element compound  $(\text{MM}')\text{O}_3$  disposed about a core or metallic compound  $\text{AO}_3$  including  $\text{Cr}_2\text{O}_3$

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(page 2, paragraph [0013], at line 3, i.e., Cr and Figures 3-7), wherein the rare earth element compound can be selected from a group (i.e., M) consisting of Y, Ce, Pr, Nd, Sm, Eu, Gd, Dy, Yb and etc. as set forth on page 1, paragraph [0012], or from group (i.e., M') consisting of Cr (i.e.,  $\text{CrO}_3$ ), a mixture including  $\text{Cr}_2\text{O}_3$  as set forth on page 1, paragraph [0012], line 5 (i.e., meet the limitations of claims 9 and 19). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize in Ichikawa et al the thermistor made of ceramic compositions having such oxide mixtures including at least one of the rare earth compounds (such as Y, paragraph [0004]) taught by Kuzuoka et al set forth above in order to improve and provide stable properties in a high temperature range (page 1, paragraph [0004]).

Regarding claim 8, since the shell has the same composition taught by Kuzuoka et al and to be used in the same environment, it is clear that the shell is also "adapted" to reduce chromia loss due to volatilizing or volatilization.

Claims 10, 19-20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al (US 4,058,787) in view of Kuzuoka et al (US 2002/0020949) as applied to claims 1-9, 11-18 and 21-22 and further in view of Alles et al (US 5,297,438). Ichikawa et al in view of Kuzuoka et al disclose substantially all features of the claimed invention except for the rare earth element compound comprises at least one compound comprising an aliovalent dopant selected from a group consisting of Ca, **Ba**, Sr, Mg, Si, and Ti (as recited in claims 9 and 20) or selected from a group consisting of the rare earth compound -oxide, -  $\text{CrO}_3$ , -nitrate, -**carbonate**, -**hydroxide**, alkoxides, carboxylates, a mixture of  $\text{M}_2\text{O}_3$  and  $\text{Cr}_2\text{O}_3$  (i.e., as recited in claim 19). Alles et al discloses the use of aliovalent dopant (column 3, lines 1-3) selected from the group consisting of the rare earth element (column 3, lines 22-23) or at least **barium** titanate (i.e., barium or **Ba** in the titanate, column 3, lines 46-49) or in the combined form including metal carbonate, metal oxide, metal hydroxide (column 3, lines 36-41) in the compound or composition for the thermistor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use such aliovalent dopant taught by Alles et al in order to exhibit a substantially greater change in the resistivity under stress (column 1, lines 39-40).

Regarding claim 22, since the claimed invention as a whole is directed to a temperature measuring system, the temperature measuring variability of the thermistor can be determined by different ways or steps depend upon the time and temperature. Such steps or process are not germane to the patentability of the resulting device unless characteristics or properties of the device are clearly recited. The Examiner's position is that such step or process intended for claim 22 has not been given any patentable weight to the claimed device. However, Alles et al also discloses there are changes in temperatures during baking the composition which may occur over different periods or times, for example to raise the temperature from 100 degrees Celsius to 700 degrees Celsius per hour where the heating rate can be lower than about 12 degrees Celsius per hour or to 1300 degrees Celsius from about 4 to about 200 hours (column 10, lines 57-68). Even though Alles et al does not indicate the exact "temperature measuring variability of less than plus or minus 5 degrees Celsius after about 1000

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hours at about 1000 degrees Celsius" as recited in claim 22, in light of Alles et al teaching, it would have been within the purview of obviousness to one having ordinary skill in the art to achieve of such temperature measuring variability depend upon the desired and required heating rate during experiment purposes.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Maher (US 3,811,937) and Cowfer et al (US 5,635,438).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu Ba Hoang whose telephone number is (571) 272-4780. The examiner can normally be reached on Mon-Thu from 8:00AM to 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu Ba Hoang  
Primary Examiner  
Art Unit 2832

January 18, 2006